

# MERCER

Investment Consulting

February 16, 2007

## Total Fund Review – Fourth Quarter Board Meeting Arizona State Retirement System

Terry A. Dennison  
Los Angeles



Marsh & McLennan Companies



# Economic Environment

# Economy Grew During Fourth Quarter

## Decline in the Housing Market Continues

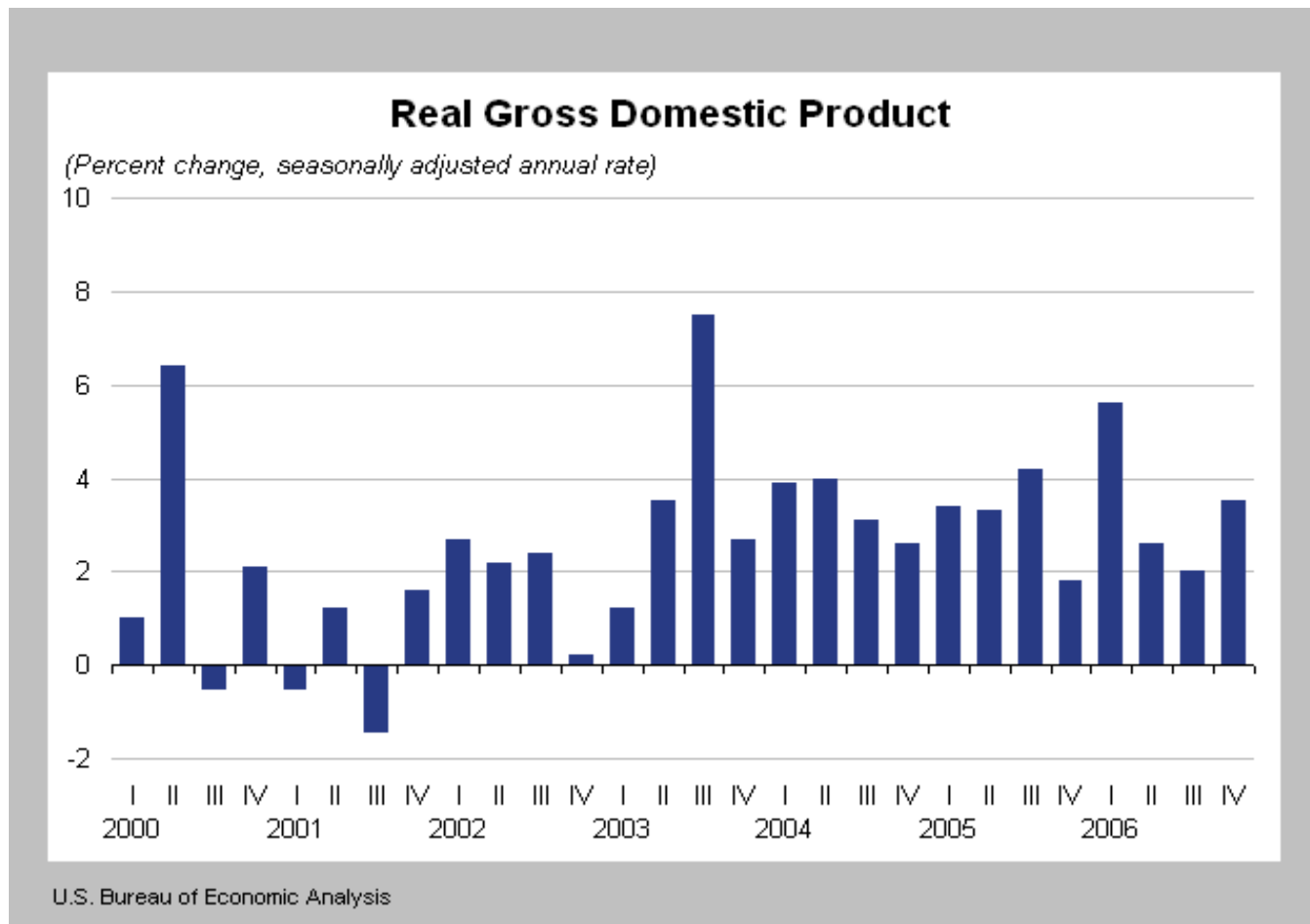
- Economic growth picked up during the fourth quarter due to stronger-than-expected consumer spending, solid job creation, and falling energy prices. The initial government estimate of fourth quarter GDP growth was 3.5%
- Payroll reports showed strong job growth with employers adding about 480,000 new jobs during the quarter. The unemployment rate at December-end was 4.5%, down from 4.9% a year ago
- Consumer confidence rose in December amid an improved job market and more optimism about the economy. Consumer spending increased at an estimated 3.5% annual rate during the fourth quarter, well above the 2.8% rate in the third quarter. For the year, retail sales were up 6%, slightly below last year's sales growth

# Economy Grew During Fourth Quarter Decline in the Housing Market Continues

- The housing market remained soft despite stronger-than-expected home sales in November. Housing starts are down 18% from a year ago, and mortgage applications are at their lowest level since August. The average 30-year fixed-rate mortgage hit a high for the year of 6.80% in July, but fell to 6.12% at the end of December

# Growth Rebounds

## Economy Continues to Show Amazing Strength

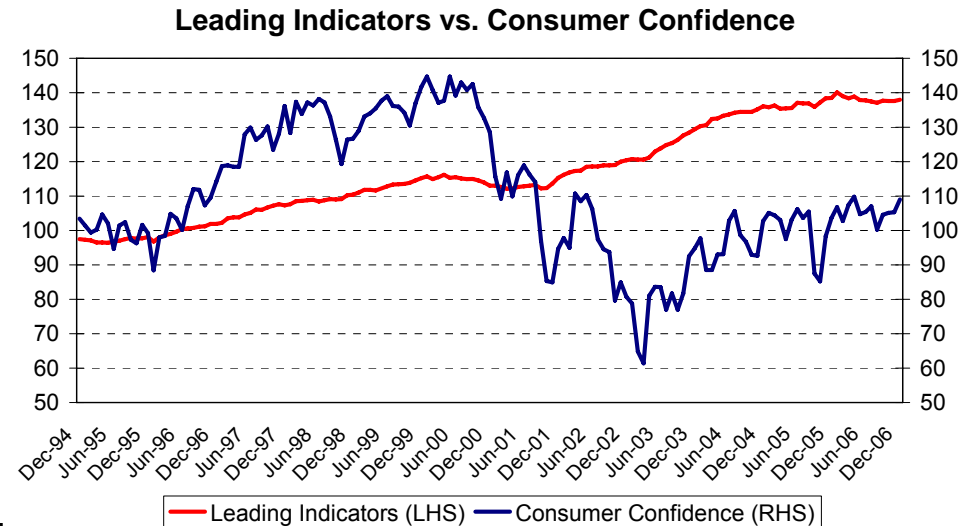


# Growth Rebounds

## Future Direction Depends on Balance of Conflicting Forces

### State of the U.S. Economy: Positives

- Consumer confidence rose late in the quarter
  - Easing of crude prices
  - Unemployment rate remained unchanged at 4.5%
  - Subsiding inflationary fears
  - Mortgage applications were up
- Business environment positive
  - Despite slowing economic activity, corporate profits remained high
  - Manufacturers' new orders for consumer goods and materials up since September
  - Significant number of corporate actions:
    - Record-setting merger and acquisition and buyout activity
    - Significant share buybacks
  - CEO confidence about future revenue growth prospects is very high (PricewaterhouseCoopers' 10<sup>th</sup> Annual Global CEO Survey)
  - Interest rates remain low globally



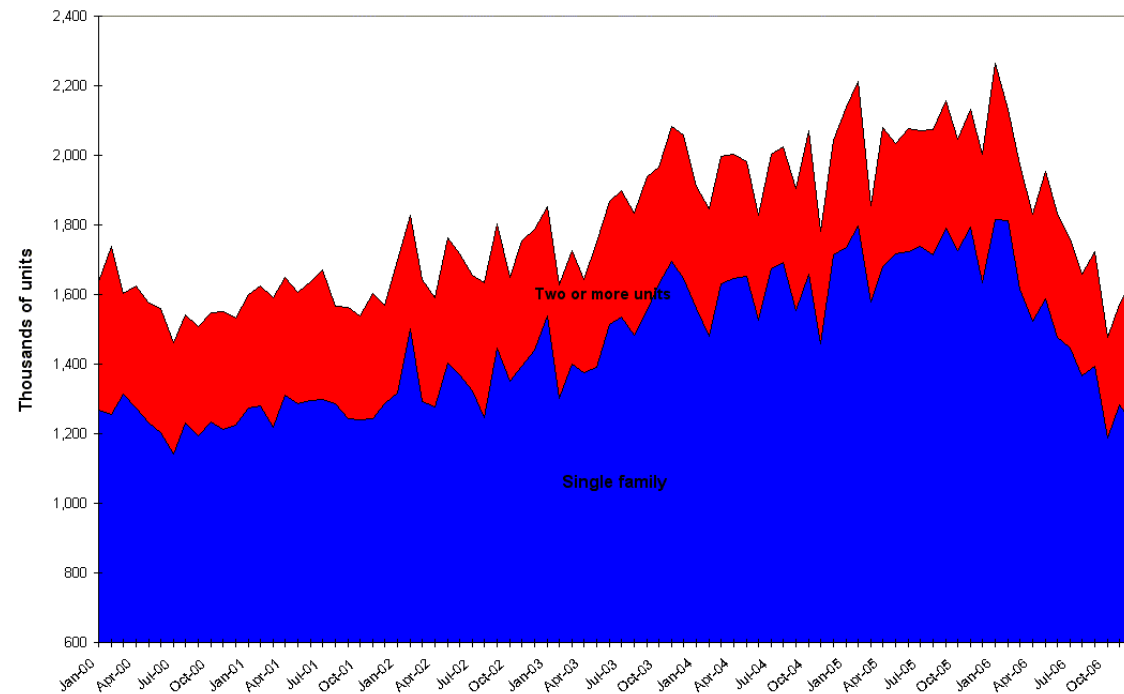
# Growth Rebounds

## Future Direction Depends on Balance of Conflicting Forces

### State of the U.S. Economy: Negatives

- Economy is clearly slowing, but to what degree?
  - Housing downturn is a major concern due to its potential spill-over effects to other sectors of the economy
  - Operating earnings are on pace to produce their lowest year-over-year gains in more than 4 years
  - Concerns over slowing corporate profits and the impact of inflation on interest rates may challenge markets in 2007
- Market environment has emboldened investors to take on risk

New Housing Units Started in the United States  
Seasonally Adjusted Annual Rate

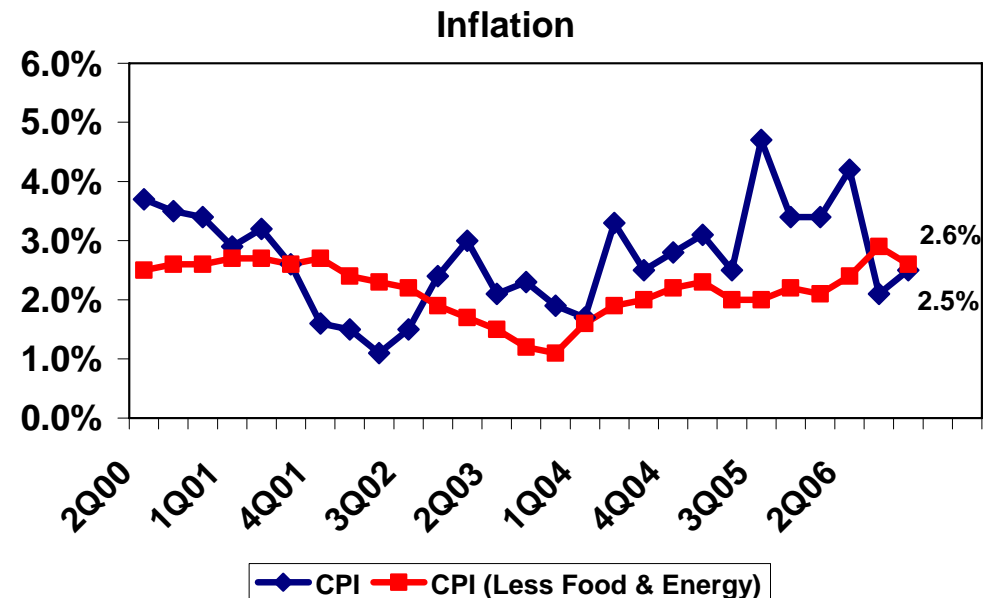


# Growth Rebounds

## Future Direction Depends on Balance of Conflicting Forces

### State of the U.S. Economy: Fed Watch & Interest Rates

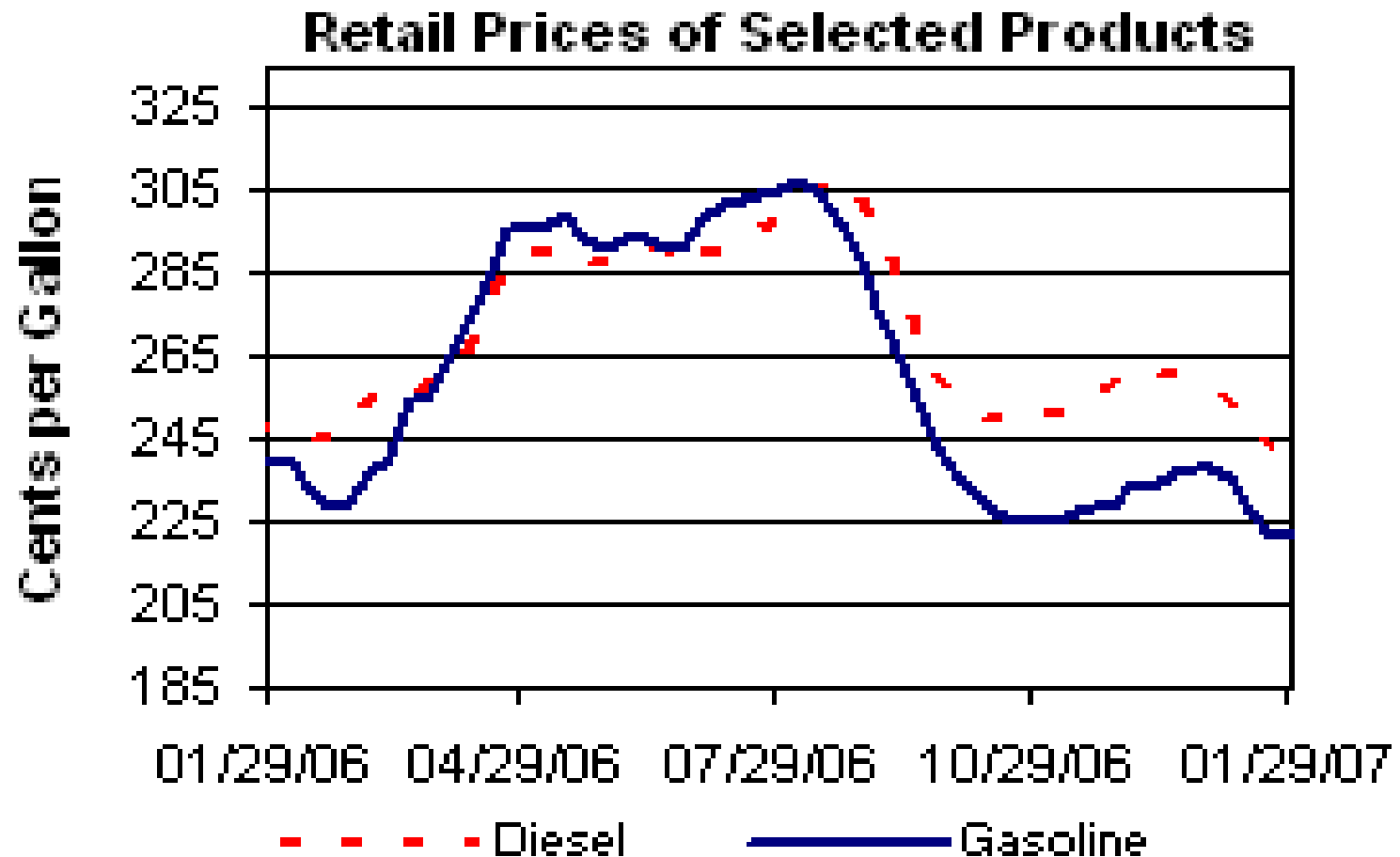
- Fed continued to hold rates unchanged at its two meetings during the quarter
  - Inflation tempered by falling crude prices and moderating economy
  - However, Fed has indicated that further policy firming may be necessary, but this will be very data-dependent
- Consumer prices rose by 2.5% in 2006
  - Best showing since 2003
  - Energy prices moderating in the second half of the year
    - Increased by 22.8% in first half of year, then declined 13.4% in the last half
  - Core CPI up 2.6% versus 2.2% in each of the preceding two years
  - Shelter component of index primary contributor
  - Upturn in apparel also contributed



Source: U.S. Department of Labor Bureau of Labor Statistics.  
All Urban Consumers. Year-over-year. Seasonally Adjusted.

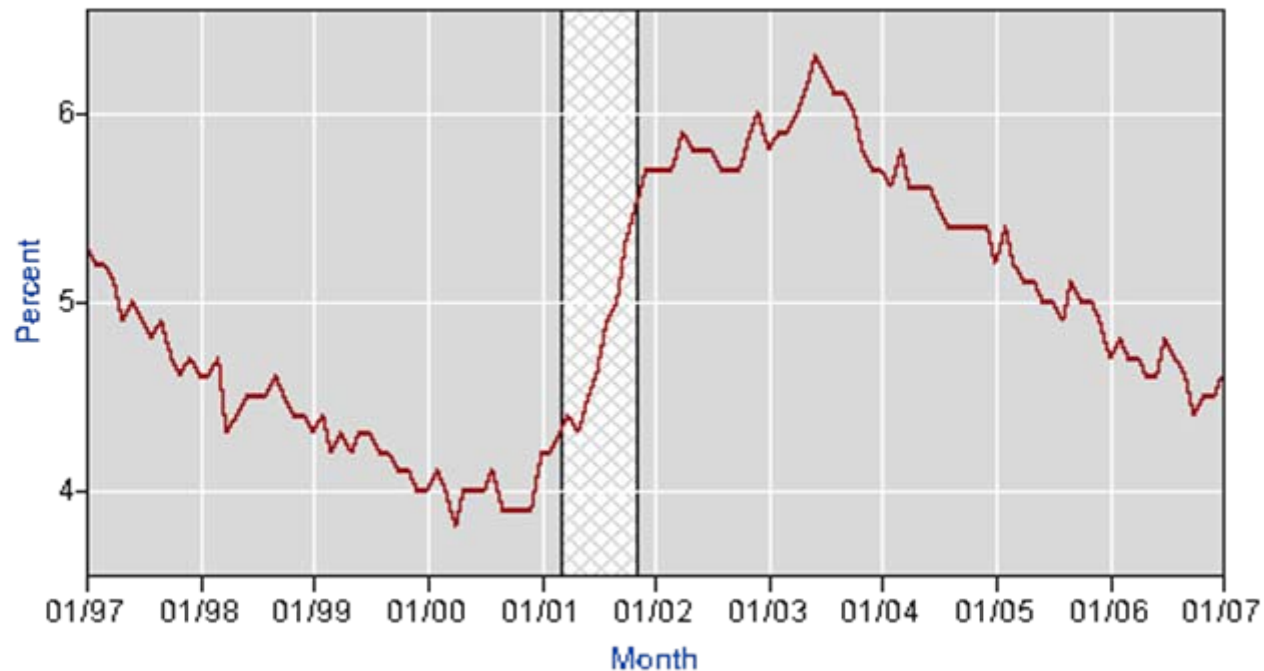


# Energy Prices Continue to Decline Improves Consumer Sentiment



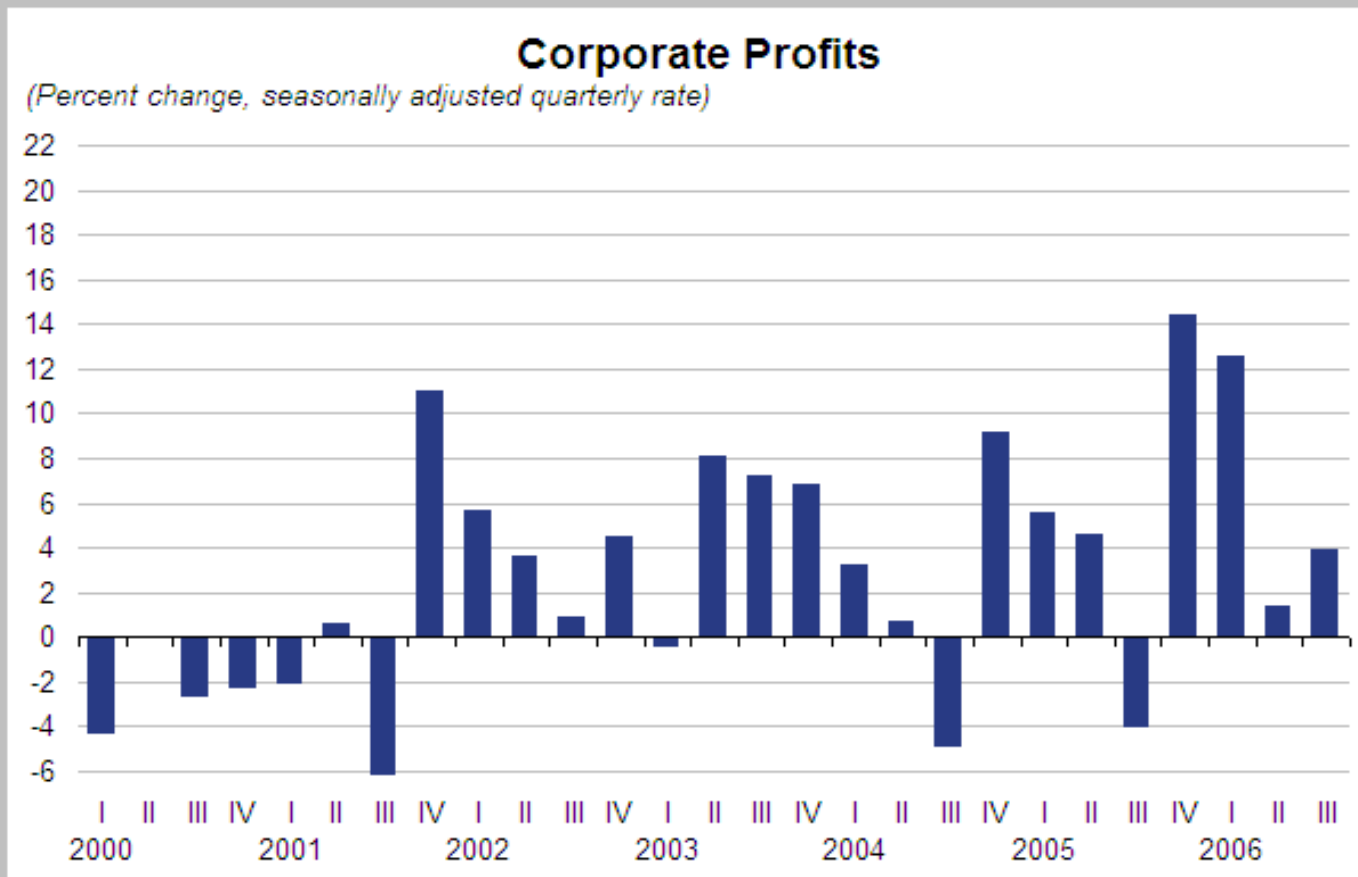
# Unemployment Edges Up Economy Sends Mixed Signals

Unemployment rate (seasonally adjusted)



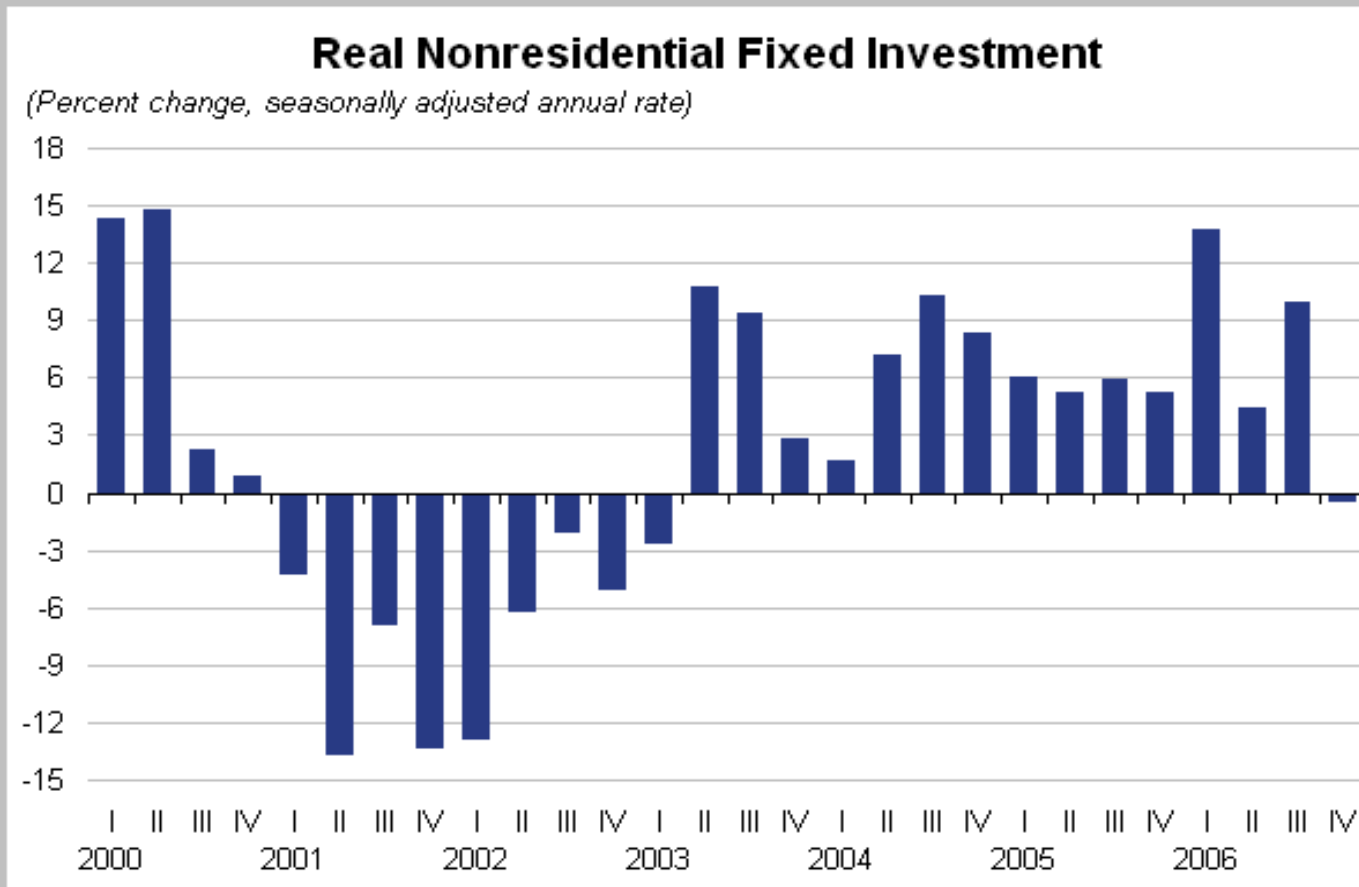
Note: Cross-hatched area represents recession.

# Corporate Profitability Continues to Grow Past Two Quarters Were a Little Weaker



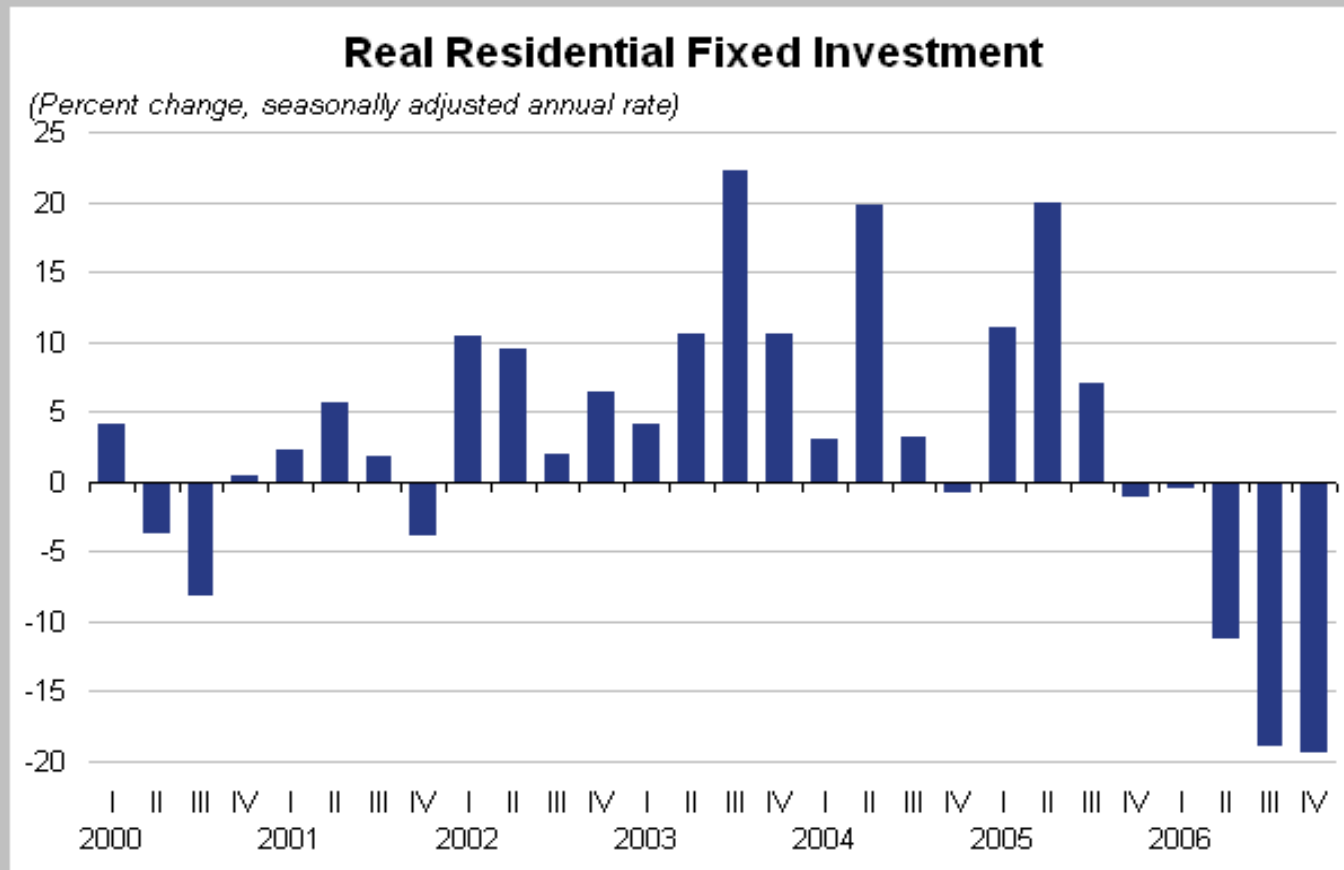
U.S. Bureau of Economic Analysis

# Non-residential Investments Slow Dramatically Need a Second Slow Quarter to Confirm



U.S. Bureau of Economic Analysis

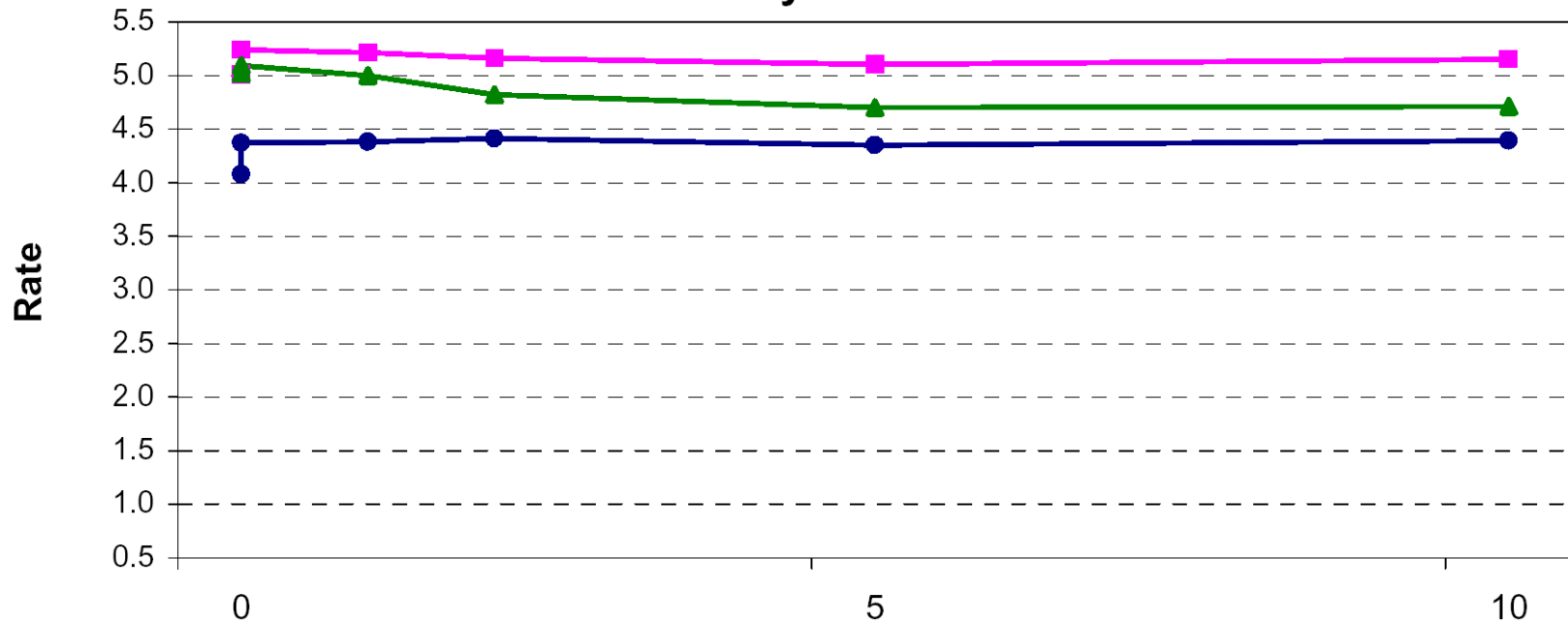
# Very Steep Decline in Housing Activity



U.S. Bureau of Economic Analysis

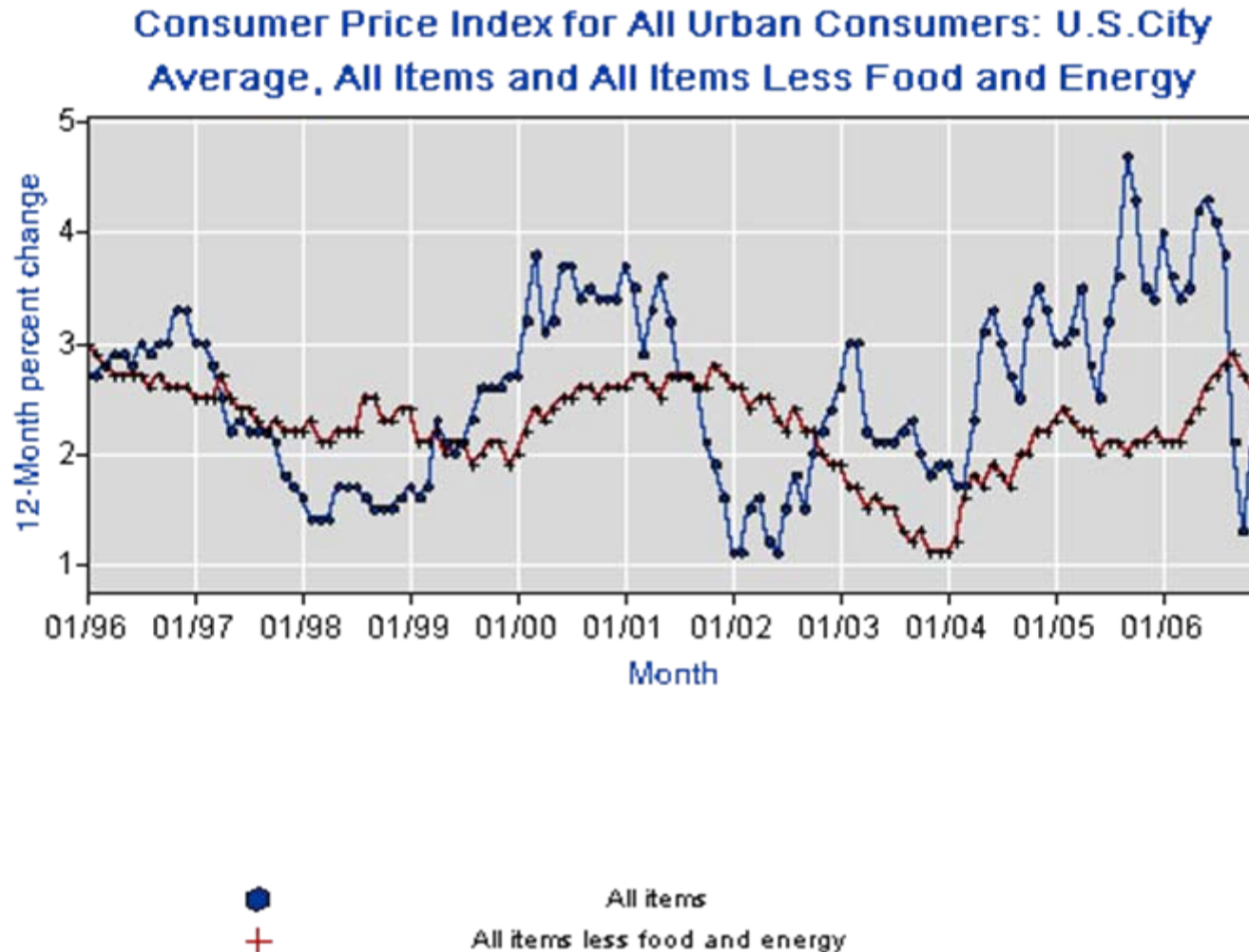
# Yields Rose During the Quarter Yield Curve Is Still Inverted

**Treasury Yield Curves**

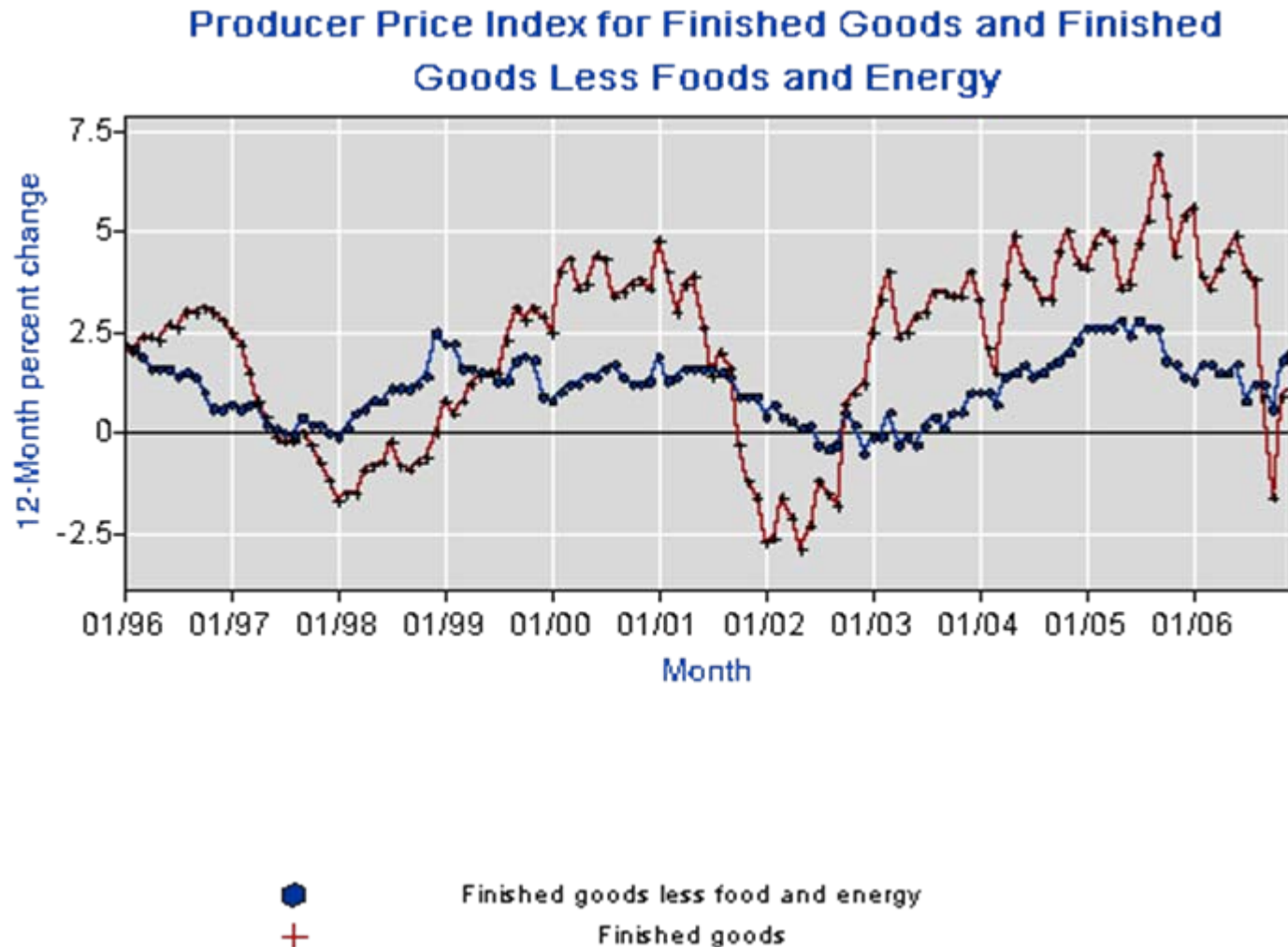


Years	0.25	0.5	1	2	5	10
Dec-05	4.08	4.37	4.38	4.41	4.35	4.39
Jun-06	5.01	5.24	5.21	5.16	5.1	5.15
Dec-06	5.02	5.09	5	4.82	4.7	4.71

# Consumer Core Inflation Is Trending Down Food and Energy Are Trending Up



# Producer Price Inflation Mirrors Consumer Inflation



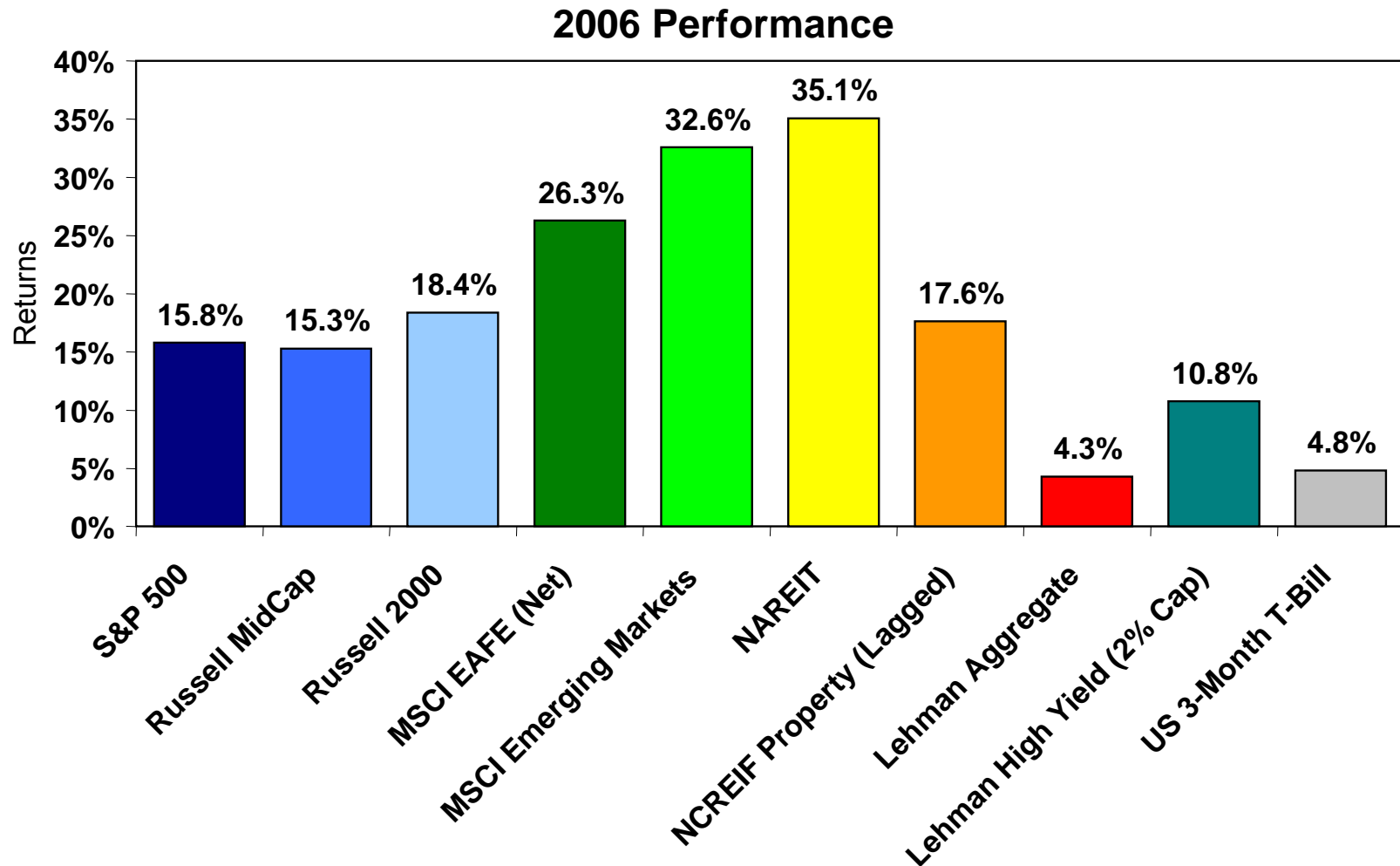




# Securities Markets

# 2006 Was A Great Year for Investors

## Only Lehman Aggregate Was Below Long-Term Expectations



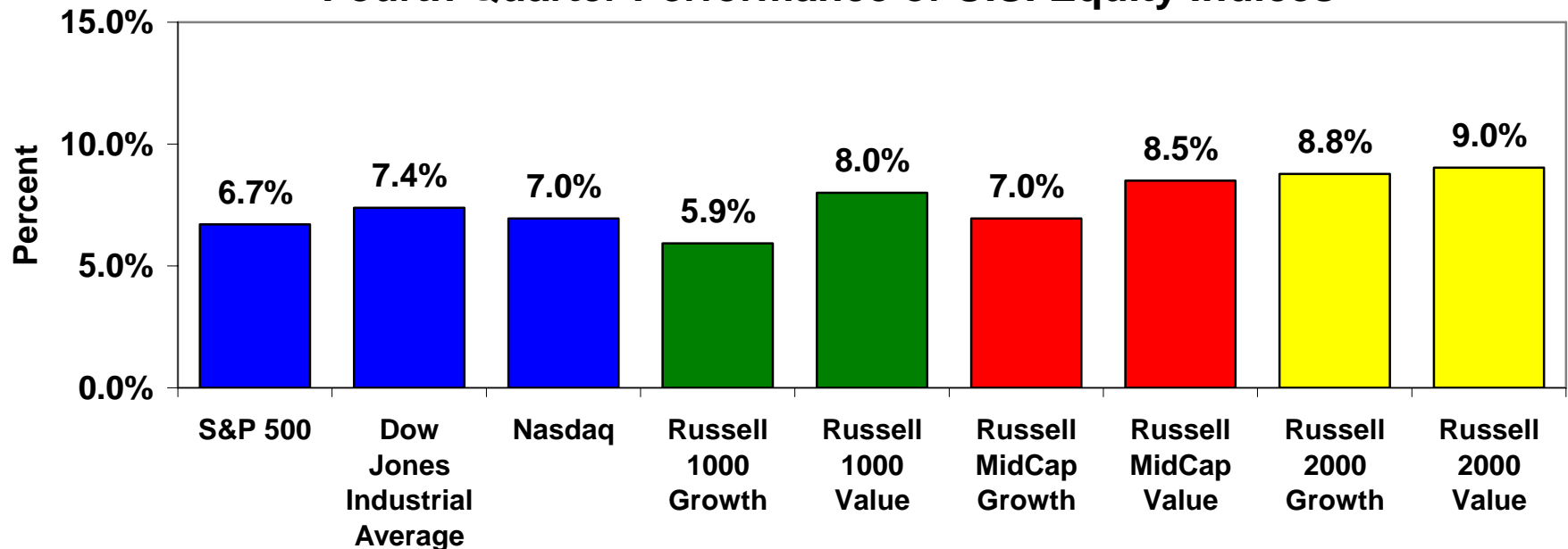
# Extremely Strong U.S. Equity Returns for 2006Q4

## Returns for the Quarter Near or Above Annual Expectations

### Capital Markets: U.S. Equity Market

- Policy decisions by the Fed to hold rates steady; easing crude prices; and benign inflation caused U.S. equities to rally
- Large cap stocks lagged small cap issues for the quarter and year
- Value continued to outperform growth

**Fourth Quarter Performance of U.S. Equity Indices**

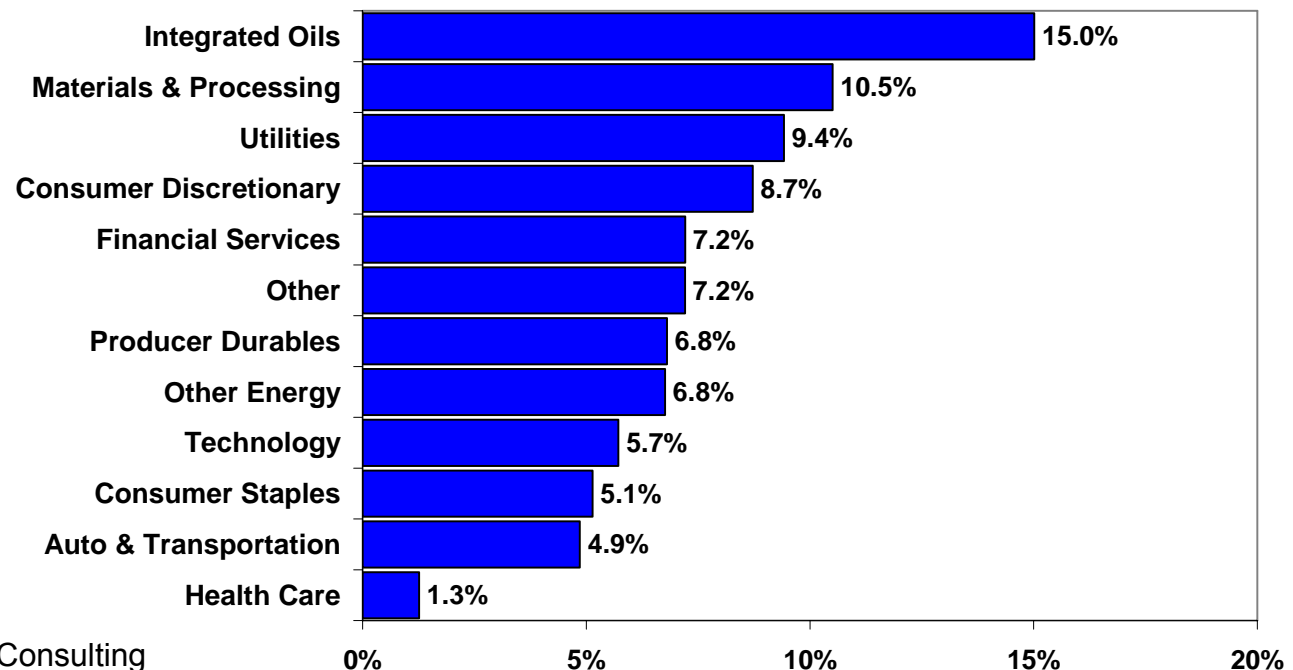


# Large Cap Stocks Were Very Strong Performance Across Sectors Was Fairly Even

## Capital Markets: U.S. Large Cap Equity Market

- Despite easing crude prices, diversified energy companies delivered strong earnings, led by Exxon Mobil (14.6% return)
- Materials & processing stocks rebounded due to momentum earnings expectations and demand in select companies
- Reform concerns in a Democrat controlled Congress sent health care stocks lower

Fourth Quarter Sector Performance - Russell 1000 Index

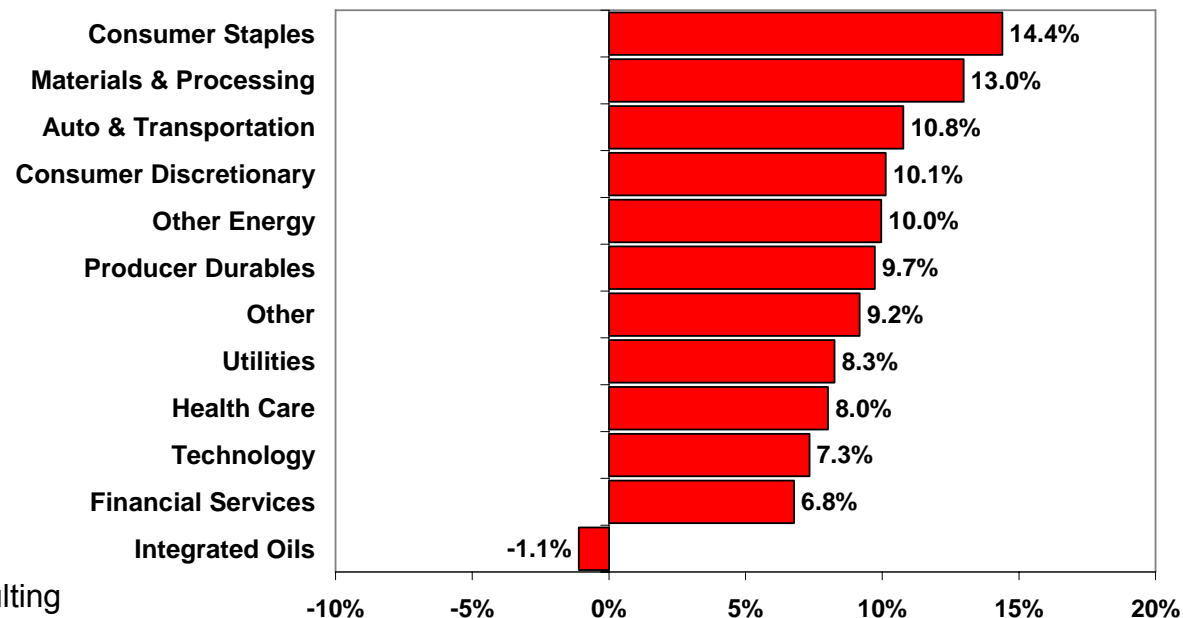


# Small Cap Consumer Stocks Were Very Strong Integrated Oil Stocks Performed the Worst!

## Capital Markets: U.S. Small Cap Equity Market

- M&A activity continues to be a major stimulant in boosting small & mid cap stocks
- Consumer confidence and spending levels elevated consumer staple and consumer discretionary stocks
- As with large cap stocks, material & processing issues performed well
- Banking stocks negatively impacted the financial services sector

Fourth Quarter Sector Performance - Russell 2000 Index



# Small Cap Regains Market Leadership

- Small Cap was very strong across the styles
- Large Growth lagged the other segments

4Q2006	Growth	Core	Value
Large	5.93	6.96	8.01
Mid	6.95	7.67	8.52
Small	8.78	8.91	9.04
Note: Russell 1000, Mid-Cap, 2000 Indices: Growth, Core, Value			

# One-Year Returns Far Above Expectations

- Core and Value are twice our current long-term return expectations
- Strongest performance for growth so far this century

1-Year Returns	Growth	Core	Value
Large	9.09	15.47	22.25
Mid	10.67	15.28	20.23
Small	13.34	18.36	23.46
Note: Russell 1000, Mid-Cap, 2000 Indices: Growth, Core, Value			

## Three-Year Results Are Strong

- Returns for all asset classes except large growth are well above long-term expectations
- Large growth has been weak since 2000 and the end of the dot-com era, but is showing signs of strength

3-Year Returns	Growth	Core	Value
Large	6.87	10.98	15.09
Mid	12.73	16.00	18.76
Small	10.49	13.54	16.47
Note: Russell 1000, Mid-Cap, 2000 Indices: Growth, Core, Value			



# Cumulative 3-Year Results Are Generally Strong

- Returns for all but large growth are excellent; recovery continues to be strong
- Value returns were exceptional

Cumulative 3-Yr	Growth	Core	Value
<b>Large</b>	<b>22.06</b>	<b>36.69</b>	<b>52.44</b>
<b>Mid</b>	<b>43.26</b>	<b>56.09</b>	<b>67.50</b>
<b>Small</b>	<b>34.89</b>	<b>46.37</b>	<b>57.99</b>
Note: Russell 1000, Mid-Cap, 2000 Indices: Value, Core, Growth			

# Five-Year Results Still Show Wide Variations

- Large Growth is making a slow comeback
- Value, particularly small/mid value, is superior to other styles

5-Year Returns	Growth	Core	Value
<b>Large</b>	<b>2.70</b>	<b>6.84</b>	<b>10.86</b>
<b>Mid</b>	<b>8.23</b>	<b>12.89</b>	<b>15.88</b>
<b>Small</b>	<b>6.93</b>	<b>11.40</b>	<b>15.39</b>
Note: Russell 1000, Mid-Cap, 2000 Indices: Growth, Core, Value			

# Cumulative 5-Year Results Vary Greatly, Depending on Market Segment

- Huge spread between growth and value
- Small and mid-value more than doubled

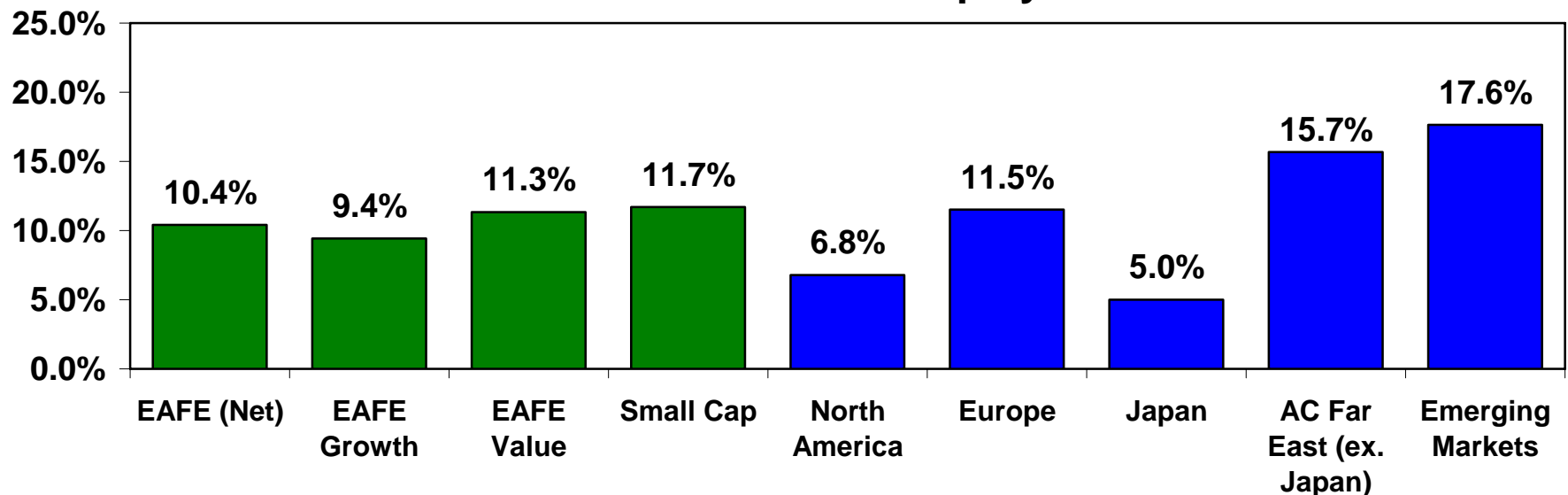
Cumulative 5-Yr	Growth	Core	Value
<b>Large</b>	<b>14.25</b>	<b>39.21</b>	<b>67.45</b>
<b>Mid</b>	<b>48.50</b>	<b>83.35</b>	<b>108.95</b>
<b>Small</b>	<b>39.80</b>	<b>71.56</b>	<b>104.57</b>
Note: Russell 1000, Mid-Cap, 2000 Indices: Value, Core, Growth			

# Non U.S. Equities Also Had a Good Quarter We Seem to Be in a Period of Sustained Global Growth

## Capital Markets: Non-U.S. Equity Markets

- Falling energy prices, economic strength and corporate activity (M&As and share buybacks) boosted non-U.S. stocks
- Europe rose 6.5% in local currency terms and was further boosted by the continued weakening of the U.S. dollar
- Japan lagged despite strength in exports and robust corporate profitability
- Emerging markets produced very strong returns

### Fourth Quarter Non-US Equity Performance

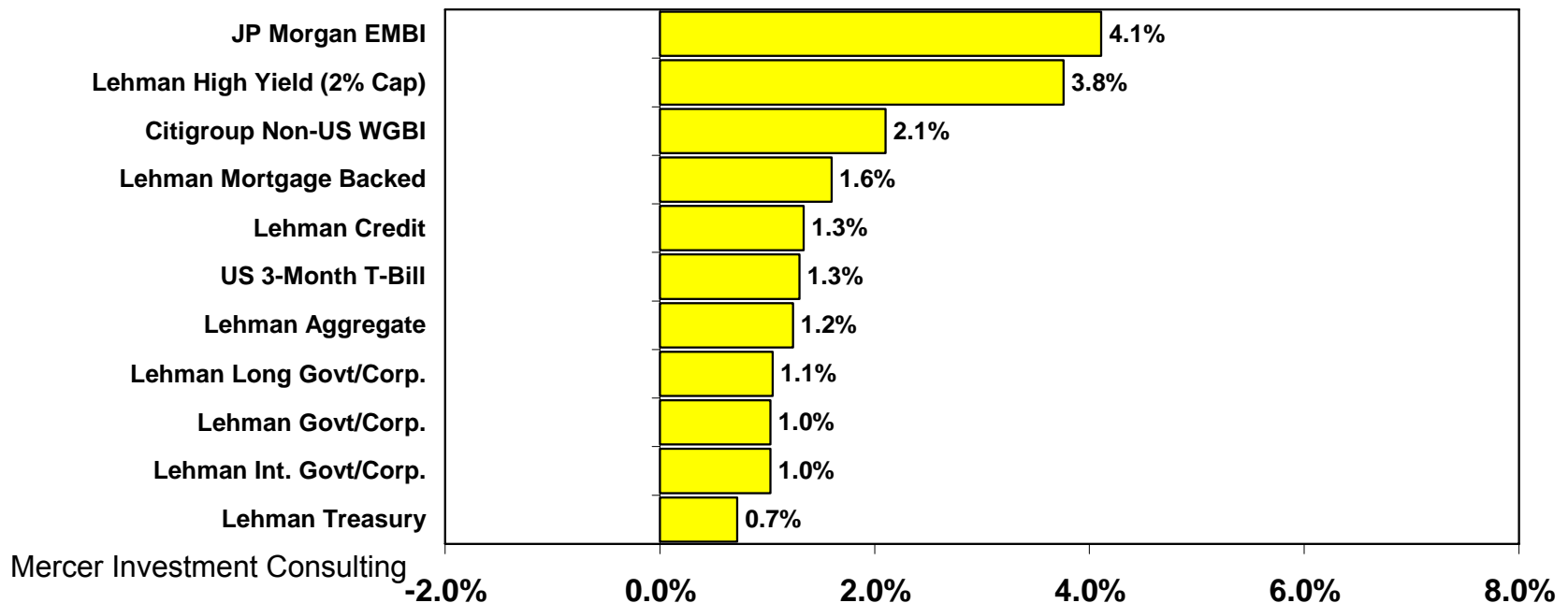


# US Fixed Income Returns Were Modest Equity-Like High Yield Continued Strong Performance

## Capital Markets: Fixed Income Market

- Moderate returns were earned in the U.S. fixed income market
- Spread markets outperformed U.S. Treasuries
- Short-term rates rose incrementally more than longer-term rates
- Out-of-benchmark sectors continued to deliver strong returns
- Market expects three Fed easings over the next 12–18 months

### Fourth Quarter Fixed Income Performance



# Alternative Investments Continue to Attract Institutional Assets

## Capital Markets: Alternatives – Private Equity

- Fundraising slowed in 4Q, but 2006 set new records with \$131.4 billion in new inflows

- Venture Capital activity:

- 37 venture capital funds raised \$2.8 billion (vs. \$4.9 billion prior quarter)
- Largest quarter: Benchmark Europe III (\$550 million), Granite Global Ventures III (\$400 million) & Sofinnova Venture Partners (\$375 million)

- Buyout activity

- 39 Buyout & Mezzanine funds raised \$17.8 billion (vs. \$22.9 billion prior quarter)

- Funds deploying capital more rapidly, which may lead to increased price pressure
- Investors are continuing to increase allocations to private equity
- Reinvestment risks are present in subsequent investments, particularly buyout

Fund Type	Periods Ending June 30, 2006			
	1 Year	3 Years	5 Years	10 Years
Early/Seed VC	11.0%	5.4%	-7.6%	36.9%
Balanced VC	20.5	12.5	-0.2	17.0
Later Stage VC	16.4	9.4	-1.1	9.5
<b>All Venture</b>	<b>16.2%</b>	<b>9.0%</b>	<b>-3.5%</b>	<b>20.8%</b>
Small Buyouts	12.1%	9.6%	3.7%	7.1%
Med Buyouts	21.5	11.8	5.0	11.1
Large Buyouts	26.8	15.8	6.3	8.6
Mega Buyouts	28.5	17.5	7.2	8.9
<b>All Buyouts</b>	<b>27.3%</b>	<b>16.3%</b>	<b>6.6%</b>	<b>8.9%</b>
Mezzanine	9.7%	5.3%	2.6%	6.2%
<b>All Private Equity</b>	<b>22.5%</b>	<b>13.4%</b>	<b>3.6%</b>	<b>11.4%</b>
<b>NASDAQ</b>	<b>5.6</b>	<b>10.2</b>	<b>0.0</b>	<b>6.2</b>
<b>S &amp; P 500</b>	<b>6.6</b>	<b>9.2</b>	<b>0.7</b>	<b>6.6</b>

Source: Thomson Venture Economics/National Venture Capital Association. The Private Equity Performance Index is based on the latest quarterly statistics from Thomson Venture Economics' Private Equity Performance Database analyzing the cashflows and returns for 1,862 US venture capital and private equity partnerships with a capitalization of \$679 billion.

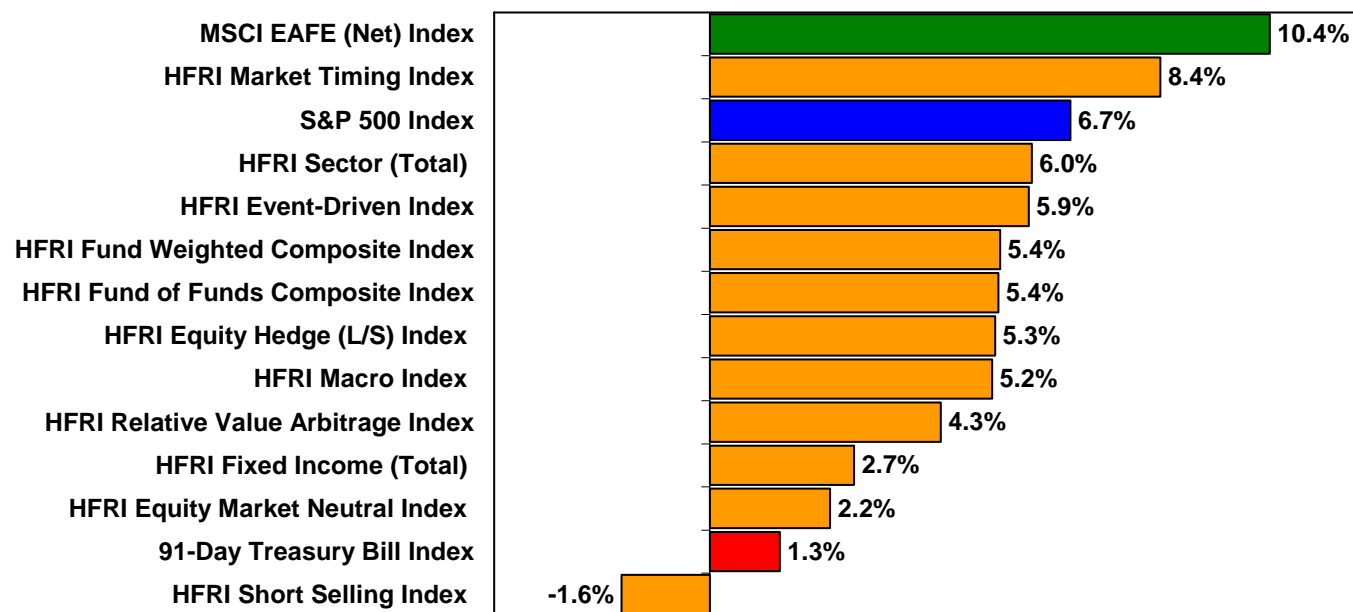
# Hedge Funds Growth Seems to Be Slowing

## Headline Risks Are More Apparent

### Capital Markets: Alternatives – Hedge Funds

- Despite slowing in 4Q, hedge funds attracted \$126.5 billion in assets for 2006
  - Equity hedge and event-driven strategies had the strongest quarter flows for 4Q
- Average hedge fund continued to lag broader equity indices
  - Returns in emerging markets lead industry for second consecutive quarter
  - On a broader basis, market timing strategies performed well while short-sellers lagged

**Fourth Quarter Hedge Fund Returns**



Source: Hedge Fund Research, Inc. Includes 6,000+ constituent funds. Includes both domestic and offshore funds. All funds report assets in USD. All funds report Net of All Fees returns on a monthly basis. Weighted Composite Index excludes fund of funds.

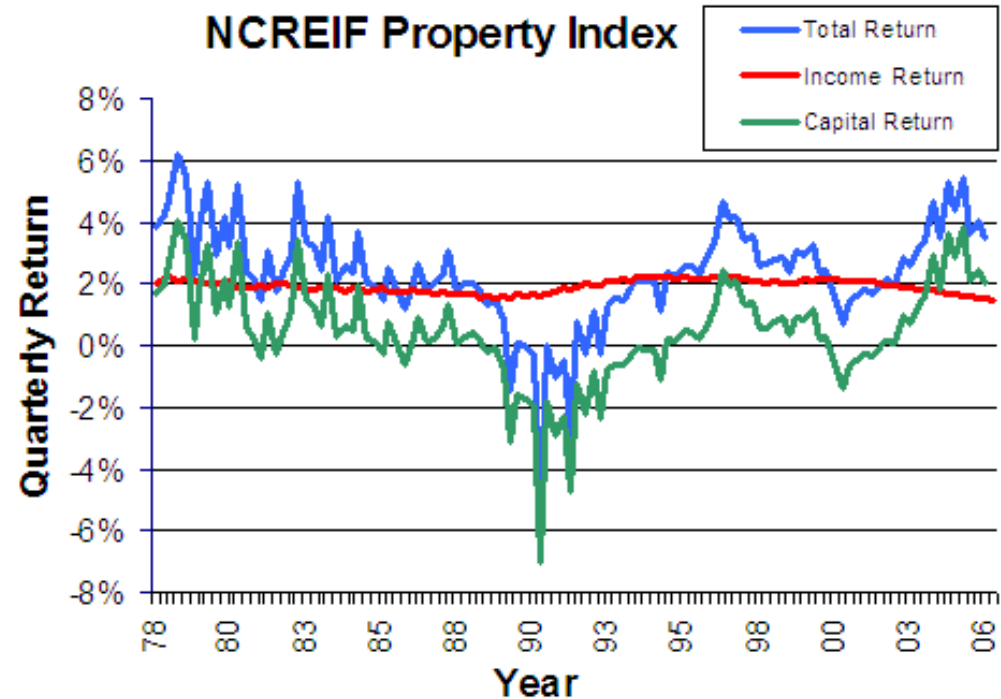
# Real Estate Provided Attractive Returns

## REITs Continue to Roll: 7th Year As Top U.S. Asset Class

### Capital Markets: Alternatives – Real Estate

#### ■ Private Real Estate

- NCREIF Property Index returned 4.5% for 4Q (1.5% Income and 3.0% Appreciation); returns for 2006 were 16.6% (6.2% Income and 9.9% Appreciation);
- Quarterly Sector Returns – hotel (7.0% return) and office (5.8%) lead performance while retail (3.4%) was the weakest sector
- Quarterly Regional Returns – East (5.7% return) and West (4.6%) continued to demonstrate the best results



#### ■ Public Real Estate

- REITS recorded very strong performance in 4Q (9.5% return) and 2006 (up over 35%); outperformed all other major U.S. equity market benchmarks for the seventh straight year
- Top-performing industry sectors included office (45.2% return); health care (44.6%), self-storage (41.0%) and apartments (40.0%)
- Boosted by number of mergers and acquisitions and steady economic growth

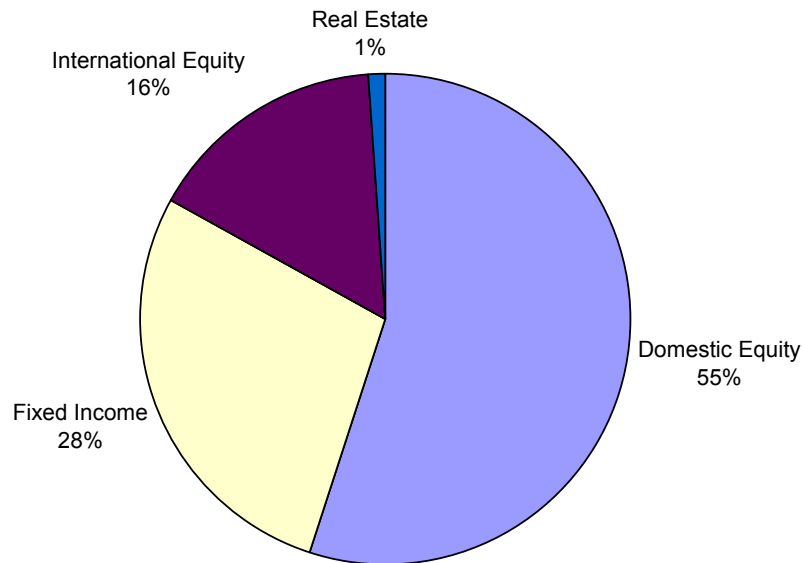




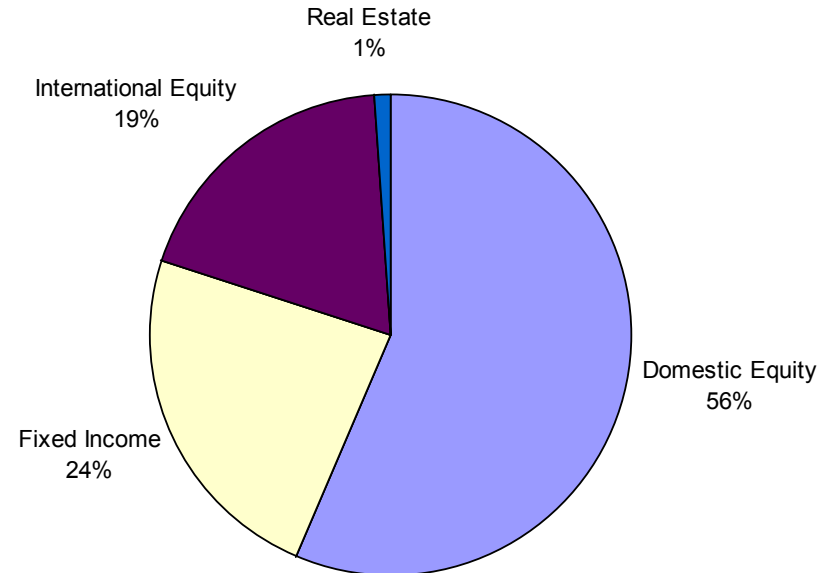
# ASRS Total Fund Performance

# Total Fund Asset Allocation December 31, 2006

**Policy Adjusted for Transition into Real Estate**

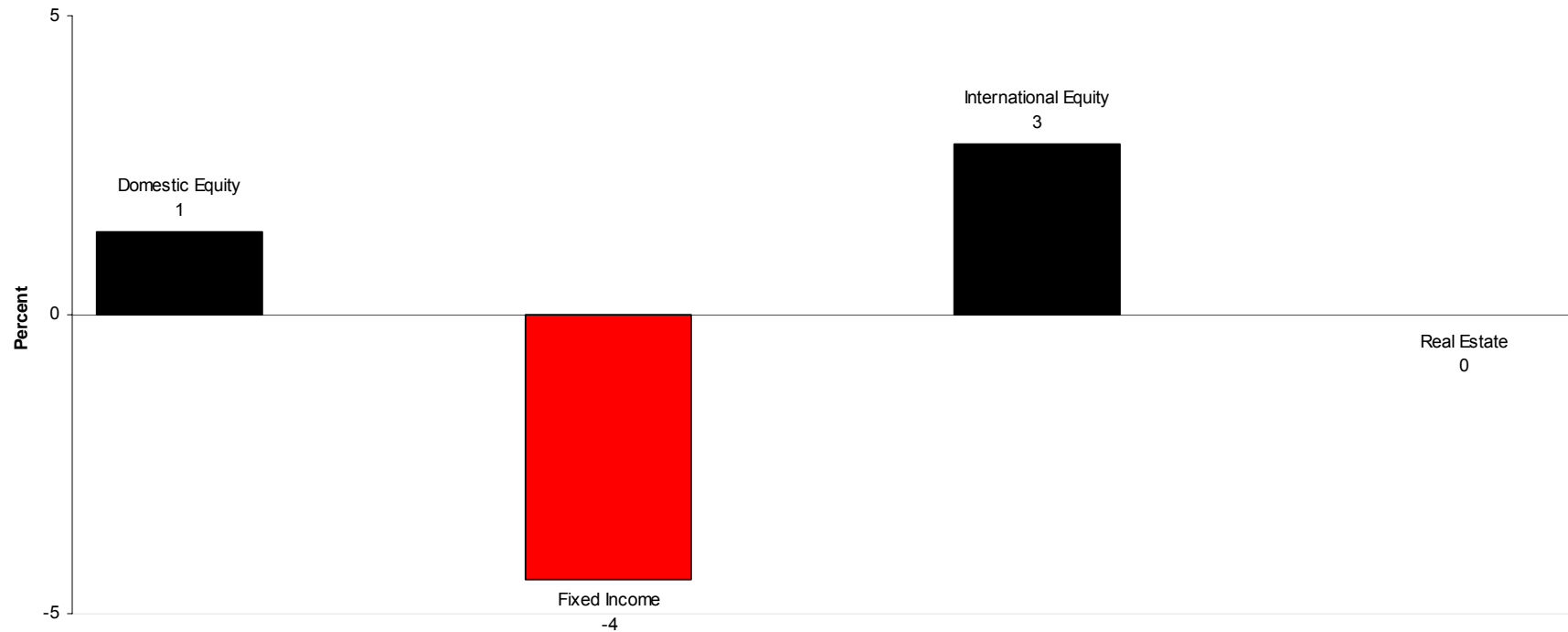


**Actual Asset Allocation**



# Total Fund Asset Allocation December 31, 2006

Actual Asset Allocation vs. Policy Adjusted for Transition into Real Estate



# Total Fund Performance

## For Periods Ending December 31, 2006

	Quarter	1 Year	3 Years	5 Years	10 Years	Inception
<b>Total Fund</b>	6.0%	14.0%	10.6%	8.2%	8.9%	11.0%
<b>Benchmark*</b>	5.8	14.3	10.2	7.7	7.8	10.8
<b>Excess Return</b>	0.2	-0.3	0.4	0.5	1.1	0.2

\* Interim Benchmark: 55% S&P 500, 28% LB Aggregate, 16% MSCI EAFE/ACW ex. US<sup>(1)</sup>, and 1% NCREIF+100 bps.

Note: Interim Benchmark incorporates a proration of 5% real estate.

### Policy History:

- 7/1/75-12/31/79 – 40% S&P 500/60% LB Aggregate
- 1/1/80-12/31/83 – 50% S&P 500/50% LB Aggregate
- 1/1/84-12/31/91 – 60% S&P 500/40% LB Aggregate
- 1/1/92-12/31/94 – 50% S&P 500/40% LB Aggregate/10% EAFE
- 1/1/95-6/30/97 – 45% S&P 500/40% LB Aggregate/15% EAFE
- 7/1/97-12/31/99 – 50% S&P 500/35% LB Aggregate/15% EAFE
- 1/1/00-9/30/03 – 53% S&P 500/30% LB Aggregate/17% EAFE
- 10/1/03-present – 53% S&P 500/26% LB Aggregate/15% MSCI EAFE/ACW ex. US<sup>(1)</sup>/6% NCREIF+100 bps.

<sup>(1)</sup> MSCI EAFE/ACW ex. US Benchmark is the MSCI EAFE prior to 10/1/05 and the MSCI ACW ex. US thereafter.

# Total Fund Performance

## For Periods Ending December 31, 2006

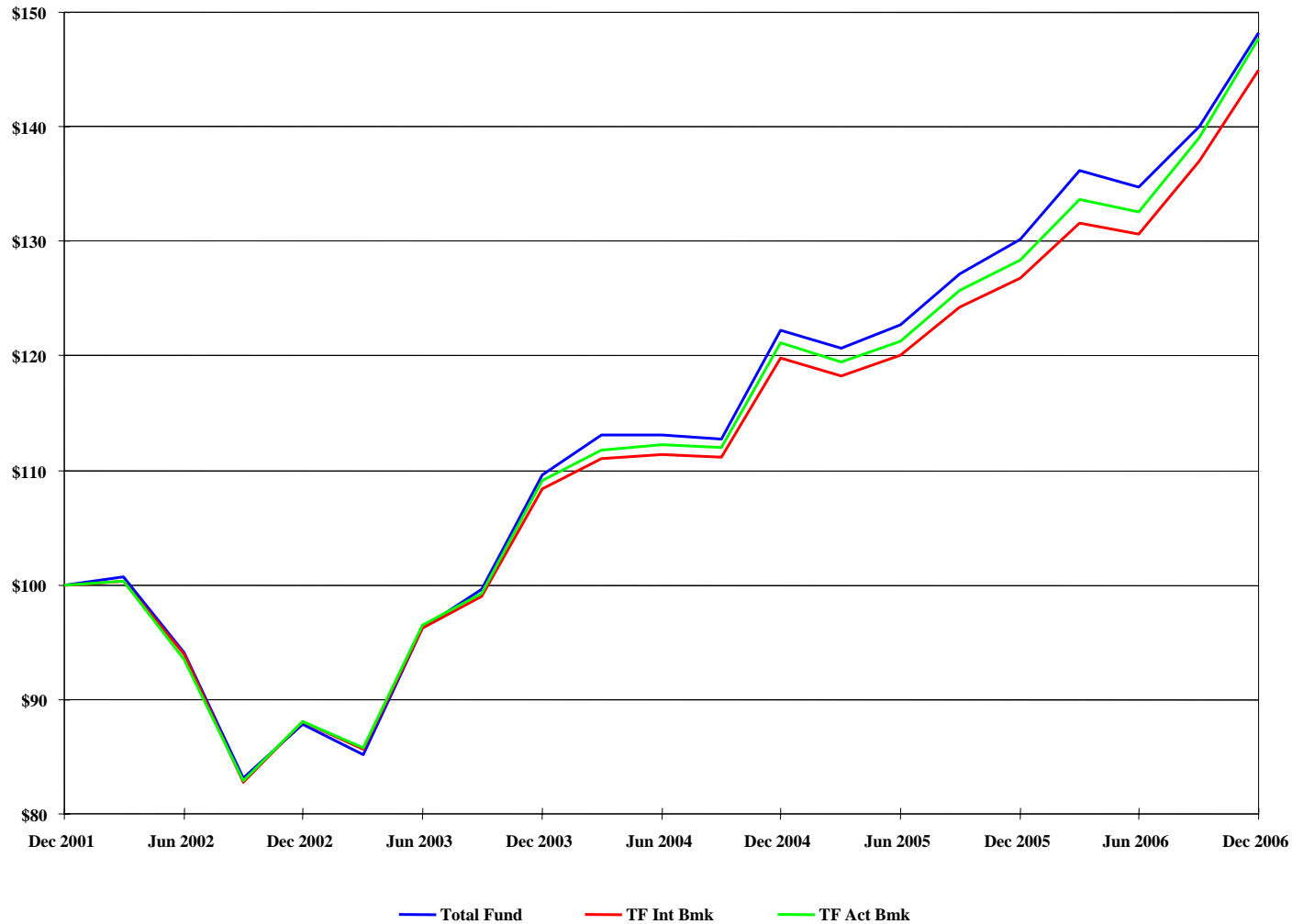
	<u>1 Year</u>	<u>3 Years</u>	<u>5 Years</u>	<u>10 Years</u>	<u>Inception</u>
<b>ASRS Total Fund</b>	14.0%	10.6%	8.2%	8.9%	11.0%
1) Actuarial Assumption	8.0%	8.0%	8.0%	8.0%	7.6%
Excess Return	6.0%	2.6%	0.2%	0.9%	3.4%
2) Asset Allocation Target	7.4%	7.4%	7.7%	8.3%	N/A
Excess Return	6.6%	3.2%	0.5%	0.6%	N/A
3) CPI Inflation + 3.75%	6.3%	6.8%	6.5%	6.2%	8.1%
Wage Inflation + 3.75%	4.6%	7.7%	7.8%	7.1%	8.2%
Excess Return - CPI	7.7%	3.8%	1.7%	2.7%	2.9%
Excess Return - Wage	9.4%	2.9%	0.4%	1.8%	2.8%

# Supplemental Comparison Information For Periods Ending December 31, 2006

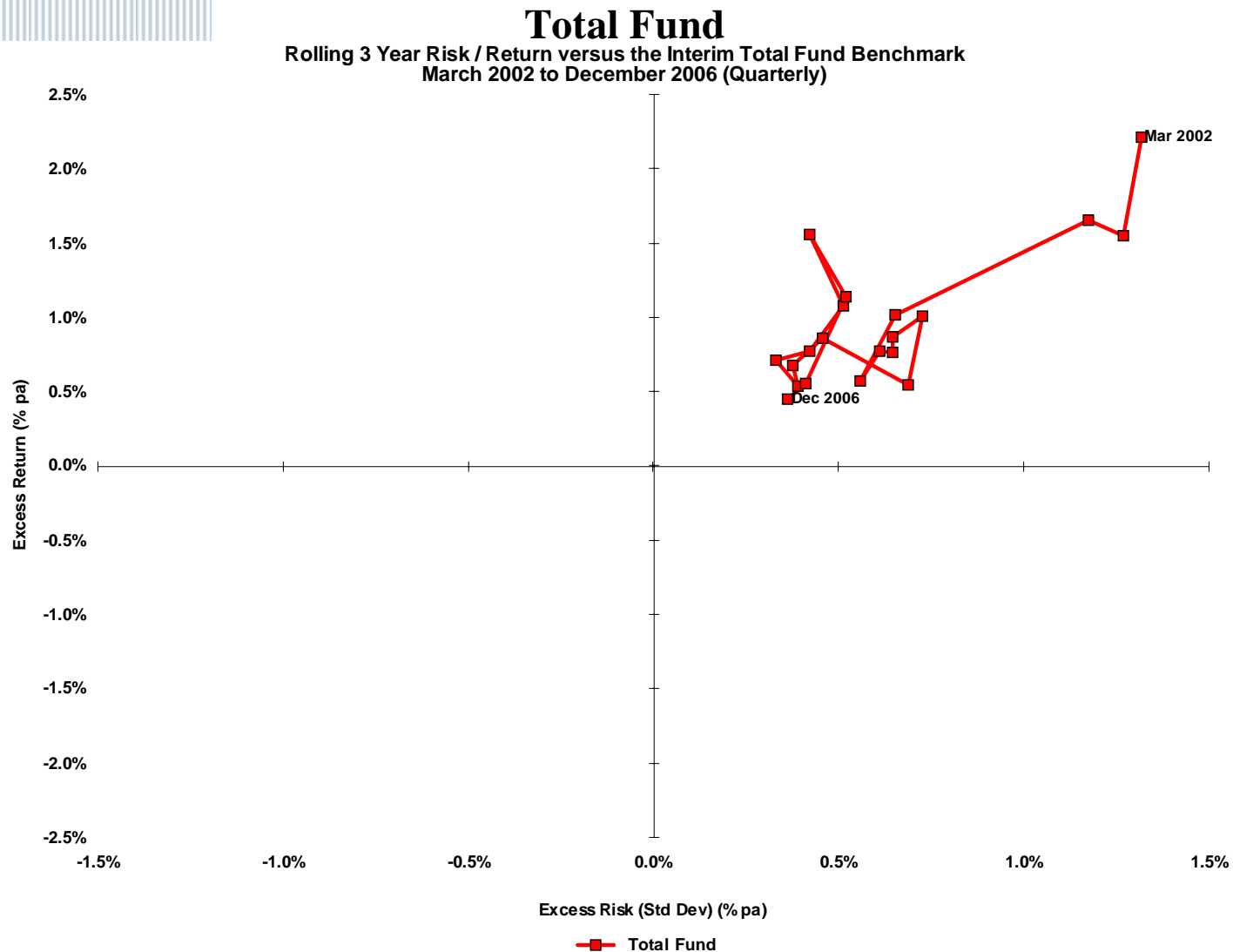
	1 Year	3 Years	5 Years	10 Years	15 Years
<b>Russell/Mellon Trust Universes</b>					
Master Trust Funds - Total Funds	40	60	67	50	49
Total Funds - Public	55	80	94	46	34
Total Funds Billion Dollar - Public	62	85	94	54	42
Total Funds - Corporate	32	54	59	44	50
<b>Wilshire Trust Universe Comparison Service</b>					
Master Trusts - All	29	40	49	45	44
Public Funds	38	45	54	39	23
Public Funds Greater than \$1.0 Billion	53	70	76	53	31
Corporate	29	44	51	54	58
<b>Callan Associates Inc.</b>					
Total Funds	38	53	62	46	36
Public Funds	39	58	64	36	23
Public Funds - Large (>1B)	56	84	86	44	24
Corporate Funds	33	45	58	46	40

# Total Fund Growth

**Total Fund**  
Value of \$100 invested in US Balanced from Jan 2002 to Dec 2006

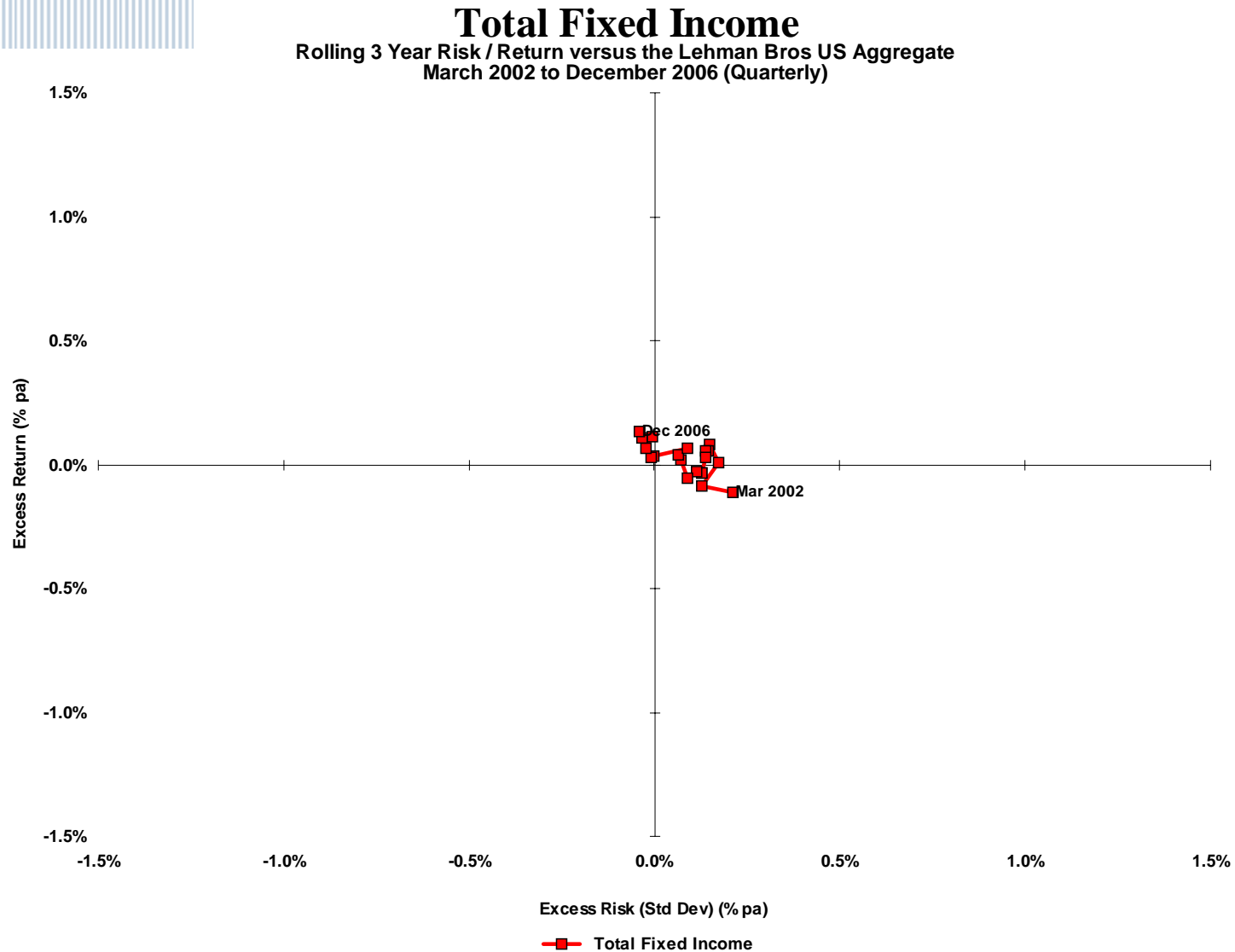


# Risk/Return Analysis

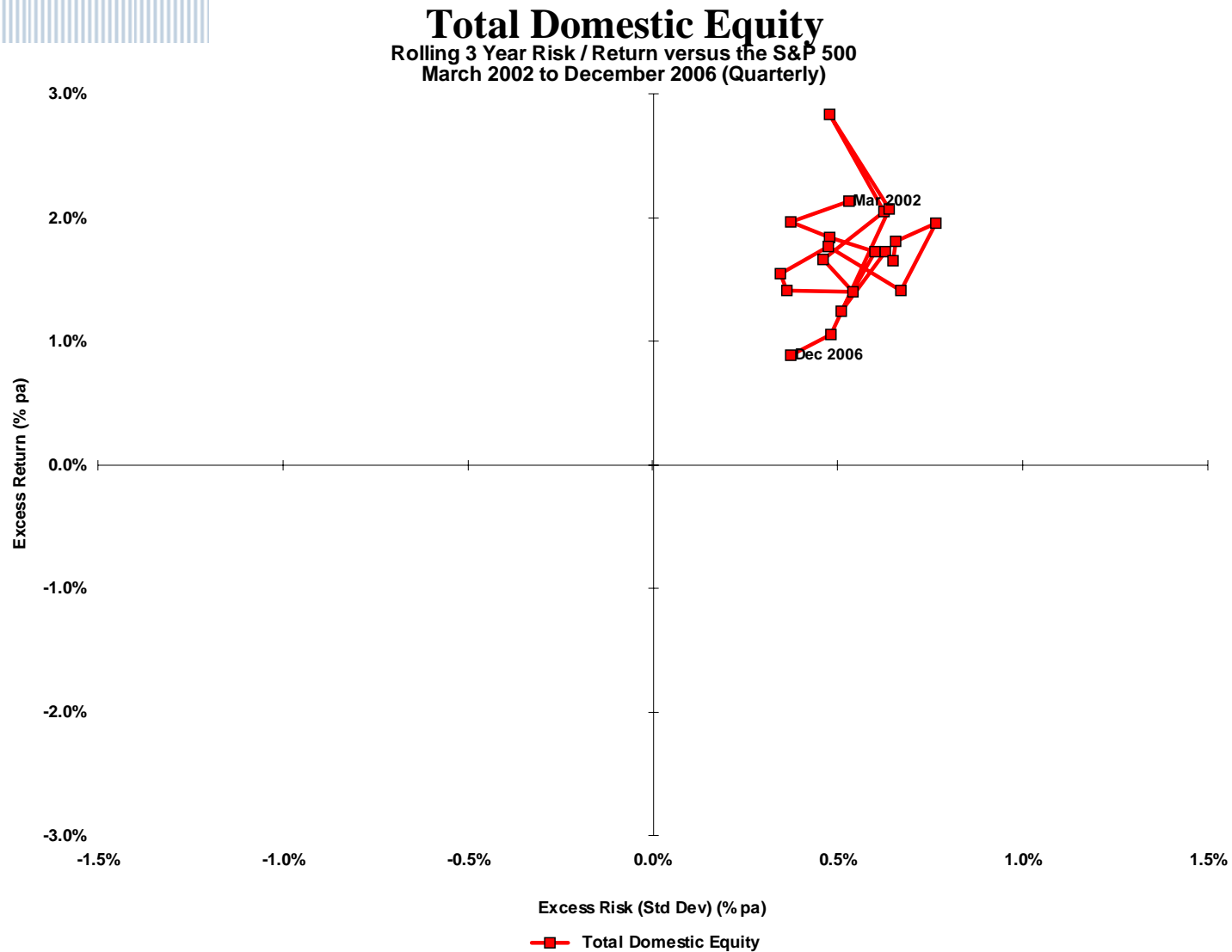




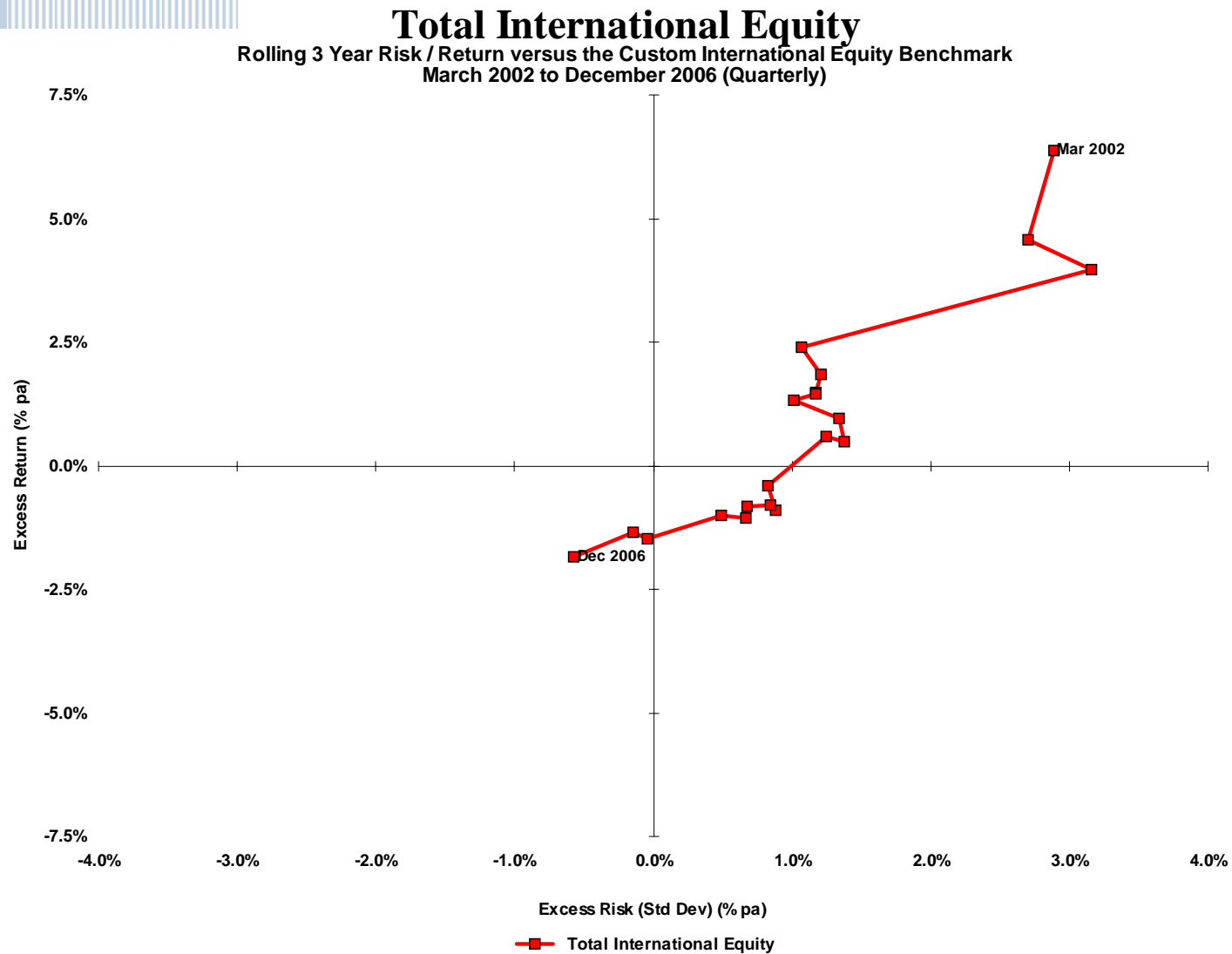
# Risk/Return Analysis



# Risk/Return Analysis



# Risk/Return Analysis



# Performance vs. Benchmarks

## For the 3 Years Ending December 31, 2006

	<u>Return</u>	Assumed <u>ROR</u>	<u>Std. Dev.</u>
Total Fund	10.6%	7.4%	5.9%
Benchmark*	10.2		5.6
Domestic Fixed	3.8	4.5	3.8
LB Aggregate	3.7		3.8
Domestic Equity	11.3	8.5	7.4
S&P 500	10.4		7.0
Intl. Equity	18.8	8.5	10.4
Custom Bmk	20.6		11.0
Real Estate	N/A	--	N/A

\* Interim Benchmark: 55% S&P 500, 28% LB Aggregate, 16% MSCI EAFE/ACW ex. US, and 1% NCREIF+100 bps.

Note: Interim Benchmark incorporates a proration of 5% real estate.

# Performance vs. Benchmarks

## For the 5 Years Ending December 31, 2006

	<u>Return</u>	Assumed <u>ROR</u>	<u>Std. Dev.</u>
Total Fund	8.2%	7.7%	11.1%
Benchmark*	7.7		10.8
Domestic Fixed	5.1	4.9	3.7
LB Aggregate	5.1		3.7
Domestic Equity	7.3	8.8	15.5
S&P 500	6.2		15.2
Intl. Equity	14.6	9.0	18.4
Custom Bmk	15.5		18.0
Real Estate	N/A	--	N/A

\* Interim Benchmark: 55% S&P 500, 28% LB Aggregate, 16% MSCI EAFE/ACW ex. US, and 1% NCREIF+100 bps.

Note: Interim Benchmark incorporates a proration of 5% real estate.